NEW RECORDS OF WETLAND AND RIPARIAN PLANTS IN SOUTHERN CALIFORNIA, WITH RECOMMENDATIONS AND ADDITIONS TO THE NATIONAL LIST OF PLANT SPECIES THAT OCCUR IN WETLANDS

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ABSTRACT

Panicum coloratum, *Panicum virgatum*, and *Setaria megaphylla* are exotic species reported for the first time for California. The following new or noteworthy records of native and non-native vascular plants are reported from wetland and riparian habitats in coastal southern California: *Amaranthus blitum* subsp. *emarginatus*, *Atriplex polycarpa*, *Bacopa monnieri*, *Beta vulgaris* subsp. *maritima*, *Chloris truncata*, *Ehrharta erecta*, *Elytrigia repens*, *Epilobium brachycarpum*, *Eriochloa aristata*, *Glinus radiatus*, *Limonium ramosissimum*, *Limonium* indet., *Oncosiphon piluliferum*, *Panicum dichotomiflorum* subsp. *dichotomiflorum*, *Paspalum urvillei*, *Psilocarphus chilensis*, *Salvinia molesta*, and *Setaria adhaerens*. Of these, *Amaranthus blitum* subsp. *emarginatus*, *Beta vulgaris* subsp. *maritima*, *Chloris truncata*, *Ehrharta erecta*, *Limonium ramosissimum*, *Oncosiphon piluliferum*, *Panicum coloratum*, *Panicum virgatum*, *Psilocarphus chilensis*, *Salvinia molesta*, *Setaria adhaerens*, and *Setaria megaphylla* are facultative wetland plants in California herein proposed for addition to the National List of Plants that Occur in Wetlands. Supplemental information is also provided to revise the current wetland indicator status for *Epilobium brachycarpum*, *Glinus radiatus*, and *Paspalum urvillei*. The new records presented herein suggest that focused floristic studies are needed to thoroughly document the flora of wetland and riparian communities in the South Coast region. In addition, watershed urbanization and exotic species established in suburban communities and in the wildland-urban interface have significantly modified the character of the native vegetation and integrity of many wetland and riparian ecosystems in coastal southern California.

Key Words: exotic species, hydrophytes, riparian, *Salvinia molesta*, urban runoff, wetlands, wetland indicator status, wetland plant lists, wildland-urban interface

RESUMEN

Panicum coloratum, *Panicum virgatum*, y *Setaria megaphylla* son especies exóticas citadas por vez primera para California. Se citan nuevos o importantes registros de plantas vasculares nativas y no nativas de humedales y zonas ribereñas de la costa sureña de California: *Amaranthus blitum* subsp. *emarginatus*, *Atriplex polycarpa*, *Bacopa monnieri*, *Beta vulgaris* subsp. *maritima*, *Chloris truncata*, *Ehrharta erecta*, *Elytrigia repens*, *Epilobium brachycarpum*, *Eriochloa aristata*, *Glinus radiatus*, *Limonium ramosissimum*, *Limonium* indet., *Oncosiphon piluliferum*, *Panicum dichotomiflorum* subsp. *dichotomiflorum*, *Paspalum urvillei*, *Psilocarphus chilensis*, *Salvinia molesta*, y *Setaria adhaerens*. Las siguientes especies: *Amaranthus blitum* subsp. *emarginatus*, *Beta vulgaris* subsp. *maritima*, *Chloris truncata*, *Ehrharta erecta*, *Limonium ramosissimum*, *Oncosiphon piluliferum*, *Panicum coloratum*, *Panicum virgatum*, *Psilocarphus chilensis*, *Salvinia molesta*, *Setaria adhaerens*, y *Setaria megaphylla* son plantas facultativas de humedales en California que son propuestas aquí para añadirlas a la Lista Nacional de Plantas que Habitan en Humedales. Se proporciona también información suplementaria para revisar el actual status indicador en humedales de *Epilobium brachycarpum*, *Glinus radiatus*, y *Paspalum urvillei*. Los nuevos registros presentados aquí sugieren que son necesarios estudios florísticos para documentar la flora de los humedales y las comunidades ribereñas de la región de la Costa Sur, además demuestra que la urbanización de la cuenca hidrográfica y la presencia de especies exóticas en comunidades suburbanas y en el punto de contacto entre tierras silvestres y urbanas han modificado considerablemente el aspecto de la vegetación nativa y la integridad de muchos humedales y ecosistemas ribereños in la costa sureña de California.

INTRODUCTION

Wetlands are lands periodically covered by shallow water or where saturation is the dominant factor that determines the nature of soil development and the types of plants and animals living in the soil and on its surface (Tiner 1999; USFWS 2004). Thus, flooding or soil saturation occurs at a duration and frequency that excludes many organisms not tolerant of the wetland environment (Brinson & Malvárez 2002). Wetlands are generally characterized by one or more of the following three attributes: (1) at least periodically, the land supports predominantly hydrophytes; (2) the substrate is predominantly undrained hydric soil; and (3) the

substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year (Cowardin et al. 1979). The attributes of hydrology, hydric soils, and hydrophytic vegetation implicit to wetland definitions, were introduced by the U.S. Fish and Wildlife Service (USFWS) and remain an important and recurring theme in wetland regulatory policy in the United States (Shaw & Fredine 1956; Mitsch & Gosselink 2000; Somerville & Pruitt 2006).

As wetland policy evolved, the U.S. Army Corps of Engineers (USACE), the primary agency responsible for regulating wetlands, adopted a slightly different, but more restrictive definition than Cowardin et al. (1979). The term wetlands is defined as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (USACE 1987, 2006). This definition requires that each of the three attributes of hydrology, hydric soils, and hydrophytic vegetation typically be present to identify legal (or jurisdictional) wetlands. Although it is implicit that all wetlands have wetland hydrology, the Cowardin et al. (1979) and other definitions indicate that only one of the three parameters needs to be present (Batzer & Sharitz 2006). The USACE Wetland Delineation Manual, and the Arid West Regional Supplement for the western states, provide the technical guidance and procedures necessary to identify and delineate wetlands that may be subject to regulatory jurisdiction under Section 404 of the Clean Water Act (USACE 1987). Wetland delineations are based on a three-parameter approach involving regional indicators of hydrophytic vegetation, hydric soil, and wetland hydrology (USACE 2006).

Riparian habitats on the other hand are "mesic islands" of vegetation associated with narrow corridors of land that border lakes, creeks, rivers or other waters (Gregory et al. 1991; Malanson 1993). Riparian ecosystems are highly variable. They can support hydrophytic vegetation, upland vegetation, unvegetated areas, or a mosaic of these types, but usually exhibit distinctive geomorphic features and vegetation that develops in response to periodic flooding or exchange of surface or ground waters between rivers and streams and adjacent habitats (USFWS 2004; USACE 2006). In addition, riparian habitats support many facultative species adapted to and/or are tolerant of high soil moisture conditions that are not usually present elsewhere in western arid landscapes, including many species of deciduous trees that are often restricted to riverine or floodplain communities (Brinson et al. 1981; Holstein 1984; Smith et al. 1989; Pattern 1998). The indicators of hydrophytic vegetation, hydrology, and hydric soils, are therefore important attributes used to classify and characterize riparian habitats, which are also typically used to delineate and separate them from jurisdictional wetlands (Bennett et al. 1989; USACE 2006).

Wetlands of the California Floristic Province are extremely varied and complex (Ferren & Fiedler 1993). Rapid urbanization, poor historical documentation, and uncoordinated conservation efforts have often resulted in the widespread and unmitigated loss of wetland resources in southern California (Ferren & Fiedler 1993). Approximately 91% of California's historic wetlands no longer exist, or the remaining habitats are often highly degraded (USFWS 1977; Dahl 1990, 2000). In addition, many wetland types have been underestimated in their diversity, richness, and unique functions and values. Since these losses occurred prior to detailed study, biologists and the general public may never fully understand or appreciate the composition, diversity, and functional values of many unique and regionally rare wetland communities in southern California (Ferren et al. 1996).

Riparian ecosystems have also suffered great losses. Estimates of 90-98% of the historic riparian habitats of central and southern California have been lost or seriously degraded by agricultural development, expanding urbanization, flood control projects, and other human-caused impacts (Katibah 1984; Swift 1984; Faber et al. 1989). Long-term human activities have also physically modified or permanently altered riparian ecosystems, which have frequently resulted in a decline of native species diversity (Bowler 1989; Brinson 1990). Thus, structurally complex riparian communities that support a diverse assemblage of native species are threatened in southern California (Bowler 1989; Ferren & Fiedler 1993).

Paradoxically, as a result of expanding urbanization, the extent of wetland and riparian vegetation communities has significantly increased in many suburban and urban watersheds. Expanding wetland and riparian habitat in urban settings can be attributed to new water sources generated by over-irrigation of

lawns and landscaping in commercial and residential development projects, discharge of municipal water treatment plant effluent into drainages, and increased dry-season stream flows associated with decreased precipitation infiltration and increased hard-surface runoff following storm events (Arnold & Gibbons 1996; Paul & Meyer 2001; Greer & Stow 2003; Burkhart & Kelly 2005; Burkhart 2006; White & Greer 2006). In a San Diego County case study, the acreage of riparian vegetation in the lower Los Peñasquitos Creek watershed increased by 56–74% between 1969 and 1982, and increased by 118–129% between 1988 and 2000, which was accompanied by a shift from an historic oak-dominated riparian community, characterized by intermittent stream flows, to a willow-dominated community associated with urban-induced perennial stream flows (White & Greer 2006). With ongoing development, more buildings and paved areas mean greater quantities of storm runoff, and growth in population and industry will also generate a proportional increase in wastewater discharges into stream and river channels. In Orange County, it is predicted that base flows for the Santa Ana River may increase by 100,000 acre-feet over the next 20 years due to urban development in upstream areas (OCWD 2006). This phenomenon is especially important since almost no perennial streams existed in southern California prior to urban development (Ellis & Lee 1919; Troxell 1948; Poland 1959; Bader 1969). In addition, escalating urban development in the upper reaches of coastal watersheds is also the likely source of new exotic plant propagules that are actively being dispersed downstream via urban drainage systems into native plant communities. Similar circumstances have been documented in expanding desert urban communities. In Las Vegas, Nevada, urban growth has generated increased discharge of municipal waters, hard-surface runoff, and storm water flows into ephemeral washes that has promoted development of extensive native wetland communities, which, over time, have been degraded by erosion and the invasion of exotic species as population pressures increase (Shanahan & Crear 2004).

Although species richness may be high, many urban wetlands are floristically degraded, often with 15% to more than 50% of the plants present being introduced species (Magee et al. 1999; Burkhart & Kelly 2005; Burkhart 2006). However, there has been little research published on the influence of urbanization-induced hydrologic changes on wetland and riparian vegetation communities, and the distributions of native and exotic plants in multi-use urban watershed environments (Poff et al. 1997; Dwire et al. 2000; Paul & Meyer 2001; Burkhart 2006). Other examples of large intermittent streams in the urban environments of southern California that are now characterized by increased dry-season base flows and other altered hydrologic regimes, and/or that support perennial flows across large segments of their drainage, include the lower watersheds of the Los Angeles River and Arroyo Seco Creek in Los Angeles County, the Santa Ana River, San Gabriel River, San Diego Creek, and San Juan Creek in Orange County, and Temescal Wash in Riverside County. The composition and areal extant of the pre- and post-urban development of wetland and riparian vegetation communities relative to new inputs of municipal water supplies has not been critically studied in many of these and other watersheds in southern California.

The natural hydrologic regimes of many of our coastal waters have now become altered owing to the advent of urbanization. Because identification of individual hydrophytes and hydrophytic vegetation communities is a major determinant of federally regulated wetlands, it has become increasingly important to identify native and exotic plants as wetland indicators in urban and urban fringe environments, which can further assist biologists during wetland delineations (Tiner 1991, 1993, 2006). During wetland delineations, hydrophytic vegetation decisions are based primarily on the wetland indicator status assigned to individual plant species compiled on the National List of Plant Species that Occur in Wetlands (Reed 1988; USACE 2006).

The purpose of this paper is to identify overlooked native or previously unreported exotic hydrophytes that would: 1) improve the accuracy and efficiency of wetland delineation procedures; 2) identify native and exotic elements of hydrophytic vegetation communities important to the conservation and restoration of wetland and riparian habitats in coastal southern California; and 3) demonstrate the need to carefully inventory unique seasonal wetland habitats prior to development, and to establish ongoing floristic monitoring of anthropogenic changes to wetland and riparian vegetation in southern California's rapidly urbanizing communities.

The distribution and abundance of hydrophytes in the flora and vegetation of southern California often define or characterize wetland and riparian ecosystems. The USFWS developed lists of wetland plants in order to assist in the field identification and classification of wetland communities according to the Cowardin et al. (1979) system (Reed 1988). Plant species that occur in wetlands (hydrophytes) are defined as species that demonstrate the ability to achieve maturity and reproduce in an environment where all or portions of the soil within the root zone is periodically saturated, continuously saturated, or inundated with water, and/or the substrate is at least periodically deficient in oxygen due to excessive wetness during the growing season (Reed 1988; Mitsch & Gosselink 2000; Tiner 1991, 2006). Roughly one third of the nation's vascular plants have some potential for being hydrophytes (Tiner 2006).

Two editions of the National List of Plant Species that Occur in Wetlands (National List) are currently published and available for use, an approved list compiled by Reed (1988) and a revised draft list prepared by the USFWS (1996); hereafter referred to as the 1988 list and the 1996 draft list (respectively). The National List was generated from 13 regional lists, including a list for California, which is Region 0 (Reed 1988; Tiner 2006). A given plant species may be a better indicator of wetlands in one region than it is in another; the regional wetland plant lists have been used to help identify wetland communities that can be recognized entirely on their vegetation components (Tiner 1991, 2006). Accordingly, wetland indicator categories of individual plant species on the regional lists have been created in order to further assist biologists with the delineation of wetland and riparian habitats throughout the United States (Tiner 1993, 2006; Mitsch & Gosselink 2000; USACE 2006). Each native or non-native species on these lists is assigned an indicator status reflecting its frequency of occurrence (not degree of wetness) in wetlands (Reed 1988), which is described in Table 1.

METHODOLOGY

Voucher specimens and other data were collected during wetland delineations, focused botanical surveys, and casual floristic surveys of wetland and riparian habitats associated with urbanized watersheds in southern California. Primary areas of study included the coastal bays and estuaries of Los Angeles, Orange, and San Diego counties, Arroyo Seco Creek and the San Gabriel River drainage in Los Angeles County, Aliso Creek, San Diego Creek, San Juan Creek, and the Santa Ana River drainage in Orange County, and the Lake Elsinore basin and San Jacinto River-Salt Creek drainage in western Riverside County.

Our approach to identifying previously unreported hydrophytes follows the "individualistic concept" of a hydrophyte defined by Tiner (1988). The individualistic concept recognizes that plant species may exhibit considerable plasticity or ecological amplitude in their adaptations to wet environments, which may represent the entire population of a species or only a subset of individuals (Tiner 1988, 1991). The potential adaptation and behavior of a species that functions as a hydrophyte in new environments is particularly important in coastal southern California where new sources of urban water has effected the spread and establishment of several exotic plant introductions that would not likely occur in this otherwise arid environment.

Field experiences in southern California, a review of the literature, a review of habitats and species data available from local herbaria (RSA-POM, UCR) and online from the Consortium of California Herbaria (2006), and well-known wetland species with which it is commonly associated were used to assign an indicator status for each of the unreported hydrophytes evaluated for addition to the National List. Identification of associated hydrophytic vegetation, wetland hydrology, and/or hydric soils of the plant community in which the suspected hydrophyte occurs follows the methodology described in the USACE Wetland Delineation Manual and the Arid West Regional Supplement (USACE 1987, 2006).

In addition, evaluation of landform position and plant community type in which the suspected hydrophyte is typically found (i.e., streamside riparian scrub), widespread wetland types (i.e., coastal bay salt marsh), aquatic sites (i.e., shallow ponds and slow-moving streams), location of its microhabitat community along moisture gradients (i.e., depressions in vernal alkali flats), man-made or man-modified habitats that

TABLE 1. Wetland Indicator Status for the National List of Wetland Plant Species that Occur in Wetlands.

Definitions for Wetland Indicator Status	
Indicator Category	*Estimated Probability of Occurrence in Wetlands*
Obligate Wetland (OBL)	Plants that almost always occur in wetlands; >99% of the time.
Facultative Wetland (FACW)	Plants that usually occur in wetlands; 67–99% of the time.
Facultative (FAC)	Plants that are just as likely to occur in wetland and in non-wetland areas; 34–66% of the time.
Facultative Upland (FACU)	Plants that occasionally occur in wetlands; 1–33% of the time.
Upland (UPL)	Plants that almost always occur in uplands; 99% of the time.
No Indicator (NI)	Assigned to plants that lack sufficient information to base an indicator status.
No Agreement (NA)	Assigned where reviewers could not achieve a unanimous agreement for an indicator.
Asterisk (*)	Assigned to indicators derived with limited ecological information, which indicates a tentative assignment that requires further review.

In addition, a plus (+) or minus (-) designation, respectively, indicates the higher or lower range for a particular indicator.

exhibit minimal hydric characteristics (i.e., ditches with seasonal flowing water or seasonal saturation that support a predominance of facultative weedy species), and/or easily recognized morphological adaptations to wet areas (e.g., shallow root systems developed on or near the soil surface) were observed during this study and further indicate these plants are functioning as hydrophytes in southern California.

NEW RECORDS OF WETLAND AND RIPARIAN PLANTS

Voucher specimens, generalized distribution, habitat association, taxonomic notes (where appropriate), a literature review, and the wetland indicator status for California are cited for each taxon discussed in this paper. References to biogeographic provinces follow Hickman (1993). Common names provided in the species discussions follow the treatments of generic experts, or if not available, we use the common name provided by Roberts (1998), DiTomaso & Healy (2003), Roberts et al. (2004), and Rebman & Simpson (2006). Facultative plants proposed for addition to the California regional list, and revisions and/or recommendations to the wetland indicator status for other species currently on the list are provided. Where appropriate, additional representative voucher specimens with notes on habitat and associated facultative plants are also provided to further establish the facultative behavior of each taxon discussed, which follows:

Amaranthus blitum L. subsp. **emarginatus** (Uline & Bray) Carretero (Amaranthaceae)

CALIFORNIA. **Los Angeles Co.:** City of Pico Rivera, San Gabriel River, Thienens Rd. near confluence with San Jose Creek, UTM (NAD 83) 11S 0405107E 3766943N, elev. 74 m (243 ft), uncommon on river banks and in wet sand, 28 Aug 2004, *Riefner 04-406* (RSA). **Orange Co.:** City of Anaheim, Santa Ana River bottom near 57-Freeway between Orangewood St. and Chapman Ave., UTM (NAD 83) 11S 0418311E 3739098N, elev. 41 m (135 ft), locally abundant in disturbed wetlands and on sandbars, 8 Aug 2004, *Riefner 04-370* (RSA); City of Yorba Linda, N floodplain of Santa Ana River near Yorba Linda Regional Park, UTM (NAD 83) 11S 0430355E 3748269N, elev. 98 m (321 ft), common in wet river wash sand, 25 Sep 2004, *Riefner 04-442* (RSA); City of Huntington Beach, Huntington Central Park at Goldenwest St., UTM (NAD 83) 11S 0406898E 3730128N, elev. 1.5 m (5 ft), locally common and highly invasive in wet ditches, drying streambeds, and margins of riparian woodlands, 9 Jul 2005, *Riefner 05-546* (RSA); City of Irvine, San Diego Creek at Alton Pkwy., UTM (NAD 83) 11S 0429107E 3724401N, elev. 45 m (148 ft), locally common in wet sand along slow-moving waters, 30 Sep 2006, *Riefner 06-458* (RSA).

Previous knowledge.—*Amaranthus blitum* L. (purple amaranth, livid amaranth), of tropical origin, is well established in many disturbed habitats in the eastern United States and Canada (Mosyakin & Robertson 2003). The distribution of the infraspecific taxa of the *A. blitum* complex is poorly known in North America however, and requires additional study (Mosyakin & Robertson 2003). *Amaranthus blitum* subsp. *emarginatus* was not treated in The Jepson Manual (Henrickson 1993). It was first reported in California from waste ground and potted plant containers in Los Angeles and Riverside counties (Hrusa et al. 2002). Additional localities for *A. blitum* subsp.

emarginatus, including populations from cultivated ground, have been reported for western Riverside County, but not from Orange County (Roberts 1998; Roberts et al. 2004). *Amaranthus blitum* (infraspecific taxon not cited) has been reported from a yard in San Diego County (Consortium of California Herbaria 2006; Rebman & Simpson 2006).

Wetland Indicator Status.—*Amaranthus blitum* subsp. *emarginatus* was not assigned a wetland indicator status for any region on the 1988 list or the 1996 draft list, but *A. blitum* has been assigned a FAC wetland indicator status for Hawaii on the 1996 draft list.

Significance and Recommended Indicator Status.—First report of *A. blitum* subsp. *emarginatus* documented for Orange County, and second report for Los Angeles County. Adapted to tropical and subtropical climates, *A. blitum* subsp. *emarginatus* was expected to be only a minor weed of greenhouse or garden situations in California (Hrusa et al. 2002). However, it has naturalized and is spreading from yards and fields to disturbed vernally moist soils, seasonal wetlands, and riparian habitats in the mild Mediterranean climate of coastal southern California. In Huntington Beach, this taxon is highly invasive in disturbed riparian scrub and wetland habitats. These new habitat records indicate *A. blitum* subsp. *emarginatus* is undergoing a range expansion and will likely colonize numerous disturbed wetlands and other moist sites associated with urbanized watershed habitats.

Based on field observations, and information available in the literature and the Consortium of California Herbaria (2006), *A. blitum* subsp. *emarginatus* should be added to the California regional list. We propose a FAC* wetland indicator status. Additional regional review is needed to specifically define its frequency of occurrence in wetlands as the species undergoes further expansions of range and invasion of new habitats.

Atriplex polycarpa (Torr.) S. Watson (Chenopodiaceae)

CALIFORNIA. **Riverside Co.:** City of Lake Elsinore, back basin of Lake Elsinore, W ca. 0.5 mi off Pete Lehr Dr. at Diamond Stadium in Wildlife Viewing Area, UTM (NAD83) 11S 0471224E 3723561N, elev. 402 m (1320 ft), locally common in *Distichlis* grassland, 7 Jul 2004, *Riefner 04-306* (RSA, UCR).

Previous knowledge.—*Atriplex polycarpa* (desert saltbush) inhabits fine-textured saline soils of warm desert shrub and saltgrass communities from 60-1500 m elevation in Arizona, California, Nevada, Utah, and northern Mexico (Welsh 2003). In California, it occupies alkaline flats and dry lakes in the San Joaquin Valley, Transverse and Peninsular Ranges, and the region lying east of the Sierra Nevada south through the California deserts (Taylor & Wilken 1993). It has not been recorded from Orange County or western Riverside County (Roberts 1998; Roberts et al. 2004; Consortium of California Herbaria 2006). With the exception of the alkali plains of the Hemet and San Jacinto River Valleys, and the coastal salt marshes, little attention has been paid to the study of alkaline soil plant communities in southern California (Riefner & Boyd 2005a).

Wetland Indicator Status.—*Atriplex polycarpa* has been assigned a FACU wetland indicator status for California on the 1988 list and the 1996 draft list.

Significance and Recommended Indicator Status.—First report of *A. polycarpa* documented for western Riverside County. This is one of a suite of seasonal wetland species, including *Eleocharis obtusa* (Willd.) Schultes var. *engelmannii* (Steud.) Gilly and *Psilocarphus chilensis* (*P. tenellus* Nutt. var. *globiferus* [DC.] Morefield), that is more typical of California's Central Valley (Boyd & Ross 1996; Riefner et al. 2002). No changes to the wetland indicator status are proposed at this time.

Bacopa monnieri (L.) Wettst. (Scrophulariaceae)

CALIFORNIA. **Orange Co.:** City of Yorba Linda, Santa Ana River bottom near Yorba Linda Regional Park, UTM (NAD 83) 11S 0429795E 3747941N, elev. 96 m (315 ft), locally common in wet river wash sand, 3 Sep 2004, *Riefner 04-419* (RSA).

Previous knowledge.—*Bacopa monnierii* (Monnier water hyssop), native to tropical and subtropical regions nearly worldwide, grows in wet soil or in shallow water in the Sonoran Desert (eastern Riverside County) to the southern United States (Strother 1993; DiTomaso & Healy 2003). It is apparently a recent alien, just becoming naturalized in our area, including San Diego County (Strother 1993; Consortium of California Herbaria 2006; Rebman & Simpson 2006). *Bacopa monnierii*, however, has not been recorded from western Riverside County or Orange County (Roberts 1998; Roberts et al. 2004).

Wetland Indicator Status.—*Bacopa monnierii* was not assigned a wetland indicator status for California on the 1988 list, but has been assigned an OBL wetland indicator status on the 1996 draft list.

Significance and Recommended Indicator Status.—First record of *B. monnierii* documented for Orange County. *Bacopa monnierii* is one of many subtropical and tropical weeds that are adapting well to disturbed urban wetlands in the South Coast region. We concur with the revised OBL indicator status assigned on the 1996 draft list.

Beta vulgaris L. subsp. **maritima** (L.) Arcangeli (Chenopodiaceae)

CALIFORNIA. **Los Angeles Co.:** Torrance, Victoria Park, Dominguez Channel, vicinity of Del Amo Blvd. and Carson Plaza Dr., UTM (NAD 83) 11S 0382502E 3746087N, elev. m (28 ft), uncommon, growing with *Distichlis* and *Atriplex lentiformis* in seasonally saturated alkali grasslands, 29 Jul 2006, *Riefner 06-329* (RSA). **Riverside Co.:** City of Wildomar, near Lake Elsinore, N ca. 0.25 mi from the intersection of Union St. and Corydon Rd., UTM (NAD 83) 11S 0471584E 3720254N, elev. 367 m (1205 ft), uncommon, growing with *Distichlis*, *Plantago elongata*, *Nitrophila occidentalis*, and *Centromadia pungens* subsp. *laevis* in seasonally saturated soils of depressions in alkali meadows, 22 Apr 1998, *Riefner 98-266* (RSA).

Previous knowledge.—*Beta vulgaris* subsp. *maritima* (sea beet), native to southern Europe, inhabits waste areas and moist, sandy places near the coast in New Jersey and southern California (Shultz 2003). In California, it has been collected from low-lying and upland habitats in Los Angeles, San Diego, and Santa Barbara counties, but not Orange or Riverside counties (Roberts 1998; Roberts et al. 2004; Consortium of California Herbaria 2006; Rebman & Simpson 2006).

Wetland Indicator Status.—*Beta vulgaris* subsp. *maritima* was not assigned a wetland indicator status for California or any other region on the 1988 list or the 1996 draft list.

Significance and Recommended Indicator Status.—First report of *B. vulgaris* subsp. *maritima* documented for Riverside County. Based on field observations, and information available in the literature and the California Consortium of Herbaria (2006), *B. vulgaris* subsp. *maritima* should be added to the California regional list. We propose a FAC* wetland indicator status and recommend additional regional review to specifically define its frequency of occurrence in wetlands as the species undergoes further expansions of range in southern California. *Beta vulgaris* subsp. *vulgaris* (cultivated beet) is sporadic in waste areas, roadsides, and fields (Shultz 2003); it has been assigned a FACU wetland indicator status on the 1988 list and on the 1996 draft list.

Chloris truncata R. Br. (Poaceae)

CALIFORNIA. **Riverside Co.:** Menifee Valley, along Newport Rd. 1 mi E of Goetz Rd. intersection, UTM (NAD 83) 0479208E, 3727278N, elev. 442 m (1450 ft), locally common in wet ditch with *Chloris virgata*, 21 Oct 2003, *Riefner 03-461* (RSA); Perris Valley, Rider Street near Perris Valley Storm Drain, UTM (NAD 83) 11S 0480399E 3742338N, elev. 483m (1585 ft), common in irrigated alfalfa fields, in disturbed seasonal wetlands with *Polypogon* and *Cyperus*, and disturbed margin of *Salix* scrub, 27 May 2003, *Riefner 03-254* (RSA); Homeland, State Hwy. 74 near 1st St., UTM (NAD 83) 11S 0483321E 3734325N, elev. 439m (1439 ft), locally common in roadside swale with *Cynodon dactylon*, *Cyperus alternifolius*, and *Echinochloa colona*, 3 Aug 2006, *Riefner 06-354* (RSA). **San Bernardino Co.:** City of Chino, along Edison Ave. at Magnolia Ave., UTM (NAD 83) 11S 0437972E 3762021N, elev. 230 m (755 ft), uncommon, agricultural ditch with *Cyperus* and *Eleusine* in fallow farmland, 31 Jul 2006, *Riefner 06-343* (RSA).

Chloris truncata (black wind-mill grass), native to Australia, is known as a weed of alfalfa fields, orchards, irrigated turf grass nurseries, and roadsides in Imperial, Merced, and Riverside counties, but not from Los Angeles, Orange or San Bernardino counties (Hrusa et al. 2002; Barkworth 2003; Roberts et al. 2004; Consortium of California Herbaria 2006; Rebman & Simpson 2006). It has also been collected in South Carolina (Barkworth 2003).

Wetland Indicator Status.—*Chloris truncata* was not assigned a wetland indicator status for California or any other region on the 1988 list or the 1996 draft list.

Significance and Recommended Indicator Status.—First report of *C. truncata* documented for San Bernardino County. *Chloris truncata* is spreading from orchards and fields to disturbed vernally moist soils, seasonal wetlands, and riparian habitats. Based on field observations, information available in the literature, and review of the Consortium of California Herbaria (2006), *C. truncata* should be added to the California regional list. We propose a NI* wetland indicator status and recommend additional regional review to specifically define its frequency of occurrence in wetlands as the species undergoes further expansions of range and invasion of new habitats.

Ehrharta erecta Lam. (Poaceae)

CALIFORNIA. **Imperial Co.:** El Centro, Imperial Ave. at Ocotillo Rd., UTM (NAD 83) 11S 0633931E 3628013N, elev. -9 m (-31

ft), few plants growing in a moist gutter and in an irrigated commercial landscape, 9 Oct 2006, *Riefner 06-488* (RSA). **Los Angeles Co.:** Verdugo Mountains near Sunland, La Tuna Canyon, N of La Tuna Canyon Rd. along La Tuna Creek, S of 210-Fwy. and ca. 1.5 mi W of 210-Fwy. intersection with La Tuna Canyon Rd. exit, UTM (NAD 27) 0379653E 3788712N, elev. 411 m (1350 ft), common, growing with *Cyperus eragrostis* in damp sand along stream banks and with *Carex spissa* in shaded willow-oak riparian woodlands, 29 Aug 2000, *Riefner 00-764* (RSA); City of Pasadena, Arroyo Seco Creek, S of Arroyo Blvd., UTM (NAD 83) 11S 0392637E 3779048N, elev. 226 m (740 ft), common in wet sand along creek in oak-willow riparian woodland, 22 Aug 2004, *Riefner 04-381* (RSA); City of Pasadena, San Rafael Hills, canyon in vicinity of Candeo Pl. and Wierfield Dr., UTM (NAD 83) 11S 0391056E 3779872N, elev. 320 m (1049 ft), common in oak riparian woodland, growing with *Cyperus* on damp stream banks, 29 Apr 2006, *Riefner 06-159* (RSA). **Orange Co.:** City of Seal Beach, San Gabriel River at River's End Café, First St. and Ocean Blvd., UTM (NAD 83) 11S 0396779E 3734148N, elev. 3 m (10 ft), common in irrigated landscapes, 23 May 1994, *Riefner 94-387* (RSA); City of Buena Park, Lincoln Ave. at Magnolia Ave., UTM (NAD 83) 11S 0409756E 3743996N, elev. 36 m (117 ft), common in roadside gutter, 18 Jun 1994, *Riefner 94-441* (RSA); City of Laguna Beach, N of Laguna Beach Country Club along Aliso Creek, UTM (NAD 83) 11S 0431343E 3708831N, elev. 20 m (65 ft), locally common on stream banks with *Salix*, 4 Mar 2002, *Riefner 02-103* (RSA); City of Lake Forest, Serrano Creek, SE of Bake Pkwy., UTM (NAD 83) 11S 0434618E 3723575N, elev. 107 m (352 feet), locally abundant in mule fat scrub along margins of ephemeral streambed, 31 May 2004, *Riefner 04-194* (RSA, UCR); City of Rancho Santa Margarita, Los Flores Rd. near Santa Margarita Pkwy., UTM (NAD 83) 11S 0444330E 3722423N, elev. 292 m (958 ft), common in irrigated landscape, 5 Jul 2004, *Riefner 04-286* (RSA, UCR); City of Aliso Viejo, Aliso Creek near Entidad Rd. at Los Alisos Blvd., UTM (NAD 83) 11S 0439164E 3723107N, elev. 220 m (721 ft), common, growing with *Cyperus* on shaded stream banks in oak riparian woodland, 5 Oct 2005, *Riefner 05-709* (RSA). **Ventura Co.:** City of Simi Valley, Santa Susana Park, UTM (NAD 83) 11S 0347007E 3792286N, elev. 331 m (1087 ft), common on stream bank with *Epilobium ciliatum* in oak-willow riparian woodland, 9 Sep 2005, *Riefner 05-656* (RSA).

Previous knowledge.—Populations of *Ehrharta erecta* (panic veldt grass), a native of South Africa, have been reported from the San Francisco Bay Area, Santa Barbara, Ventura, Los Angeles, western Riverside, and San Diego counties (Bossard et al. 2000; Roberts et al. 2004; Rebman & Simpson 2006). Although it is a common urban weed in southern California, it has not been reported from Orange County (Roberts 1998; Bossard et al. 2000). However, it has been recently collected from roadside habitats in Orange and San Bernardino counties (Consortium of California Herbaria 2006). *Ehrharta erecta* infests wildlands in most or all of the North and Central Coast, but there are relatively few reports of it in southern California native habitats (Sigg 1996, 2003; Roberts et al. 2004). Its preference for moist environments suggests it might become a threat to wetlands and riparian habitats (Sigg 1996, 2003). *Ehrharta erecta* is also recognized as a species with the potential to spread explosively in California (CalEPPC 1999).

Wetland Indicator Status.—Although *E. erecta* inhabits moist environments in urban and wildland situations, it has not been assigned a wetland indicator status for California or any other region on the 1988 list or the 1996 draft list.

Significance and Recommended Indicator Status.—First report of *E. erecta* documented for Imperial County, where it has likely been introduced with landscape plantings for urban development projects; verification of a herbarium record for Orange County. Additional records of *E. erecta* are documented from native riparian and stream course habitats in Los Angeles, Orange, and Ventura counties. In Orange County, *E. erecta* is vigorously expanding its range from the coast into the foothills of the Santa Ana Mountains in many types of urban environments owing to landscape gardening practices associated with expanding urbanization. Based on field observations, information available in the literature, and review of the Consortium of California Herbaria (2006), *E. erecta* should be added to the California regional list and assigned a FAC wetland indicator status.

Elytrigia repens (L.) Nevski (Poaceae)

CALIFORNIA. **Orange Co.:** City of Costa Mesa, South Coast Dr. at Susan Rd., UTM (NAD 83) 11S 0415261E 3728412N, elev. 16 m (52 ft), swale and margin of mule fat scrub, 1 Oct 2005, *Riefner 05-704* (RSA).

Previous knowledge.—*Elytrigia repens* (*Agropyron repens* [L.] Beauv.; quackgrass), native to Eurasia, is a weed of cultivated ground and other disturbed sites throughout California (except the deserts and high elevation montane habitats) to the eastern United States (Jarvie & Barkworth 1993). However, it has not been reported from Orange, Riverside, or San Diego counties (Roberts 1998; Roberts et al. 2004; Rebman & Simpson 2006). Most records from the South Coast region are from Santa Barbara County (Consortium of California Herbaria 2006).

Wetland Indicator Status.—*Elytrigia repens* has been assigned a NI designation for California on the 1988 list (as *Agropyron repens*) and a FAC* wetland indicator status on the 1996 draft list.

Significance and Recommended Indicator Status.—First report of *E. repens* documented from Orange County. We concur with the revised FAC* indicator status as the species requires further review as it spreads in the South Coast region.

Epilobium brachycarpum C. Presl (Onagraceae)

CALIFORNIA. **Butte Co.:** along flood control slough, ca. 4 mi N of Chico on Hwy 99, 8 Sep 1978, *Taylor 1894* (CHSC). **Humboldt Co.:** Northern Coast region, near Hydesville, gravel bar on Yager Creek, 9 Sep 1900, *Tracy 946* (UC). **Lake Co.:** below the high water line of Indian Valley Reservoir, W of the causeway in the NW part of the reservoir, W side of Bartlett Springs Rd., 4 Oct 2004, *Ahart 11446* (CHSC); Mendocino National Forest, Stonyford Quadrangle, sag pond 1 mi N of Sheep Corral, 19 Sep 1936, *Schreiber 2334* (UC). **Los Angeles Co.:** Transverse Ranges, Liebre Mountains, Cow Spring Pond, sag pond on the San Andreas Fault at the N foot of Liebre Mtn. on the S side of West Oakdale Canyon Rd., ca 100 m W of the Cow Spring Canyon drainage, 34°44'12"N 118°38'45"W, 21 Sep 1994, *Ross & Boyd 8327* (RSA); Liebre Mountains, SW end of Quail Lake, seasonally flooded depression on S side of Hwy 138, 34°46'13.6"N 118°45'16.5"W, 14 Oct 1996, *Boyd & Raz 9086* (RSA). **Mendocino Co.:** Northern California Coast Range Preserve, Elder Creek, margins of creek about 0.5 to 1 mi upstream above confluence with South Fork Eel River, 23 Jun 1961, *Sharsmith 4905* (UC). **Mono Co.:** Leavitt Meadows, West Walker River, gravel bench along river, 1 Sep 1944, *Alexander & Kellogg 4174* (UC). **Orange Co.:** City of Yorba Linda, Santa Ana River, Horseshoe Bend in Santa Ana Canyon, UTM (NAD 83) 11S 0431466E 3749276N, elev. 99 m (323 ft), floodplain in *Baccharis salicifolia* scrub, 5 Oct 2005, *Riefner 05-705* (RSA). **Plumas Co.:** W side of Little Last Chance Creek, strand of Frenchman Lake, 29 Aug 2001, *Ahart 9254* (CHSC). **Riverside Co.:** Peninsular Ranges, Perris-Aguanga Basin region, floodplain E of dike along San Jacinto River, W of Sedco Hills community, 29 Sep 1994, *Boyd & Banks 837* (RSA); City of Hemet, vicinity of Warren Rd. at Florida Ave., UTM (NAD 83) 11S 0496489E 3724636N, 460 m (1510 ft), scattered in vernal alkali grassland with *Hordeum intercedens*, *Cressa truxillensis*, *Veronica peregrina* subsp. *xalapensis*, *Centromadia pungens* subsp. *laevis*, and *Chamomilla occidentalis*, 31 Jul 2004, *Riefner 04-347* (RSA); SE of Temecula and E of Pechanga Indian Reservation, Cleveland National Forest, Agua Tibia Wilderness, N slope of Agua Tibia Mountain, ca. 1.5 mi WNW of Woodchuck Rd., UTM (NAD 83) 11S 0497415E 3699899N, 665 m (2180 ft), scattered along bank and bed of unnamed blueline stream with *Baccharis salicifolia*, 31 Jul 2005, *Riefner 05-57* (RSA); San Jacinto Mountains, McCall Park, McCall Park Rd. near Hwy 74, UTM (NAD 83) 11S 0524882E 3729641N, 1360 m (4462 ft), growing with *Muhlenbergia rigens* along ephemeral stream, 7 Aug 2005, *Riefner 05-591* (RSA); San Jacinto Mountains, near McMullen Flat on SR 243, Valley Hi County Park, UTM (NAD 83) 11S 0516223E 3747936N, 1139 m (3737 ft), common, growing with *Crypsis* and *Amaranthus californicus* along edge of drying pond and ephemeral creek, 12 Aug 2005, *Riefner & Sanders 05-601* (RSA). **San Bernardino Co.:** Transverse Ranges, San Bernardino Mountains region, NW shore, alkaline margin of Baldwin Lake, s.d., *Thorne & Wisura 53689* (RSA). **San Diego Co.:** bank of stream 12 mi E on hwy to Santa Ysabel–Ramona, 29 Aug 1927, *Wiggins 2607* (UC); Agua Tibia Mtns., Rainbow Heights Rd. East, ca. 0.7 mi N from Rainbow Heights Rd. West, UTM (NAD 83) 11S 0490270E 3698344N, elev. 491 m (1611 ft), perennial seep with *Juncus* and *Cyperus*, 7 May 2006, *Riefner 06-182* (RSA). **Trinity Co.:** Van Duzen River, gravel bar, river 3 mi above Low Gap, 4 Sep 1939, *Tracy 16483* (UC). **Yuba Co.:** along a small stream, below the high water line of Sly Creek Reservoir, about 1/8 mi SW of Day Camp, Sly Creek Reservoir, 9 Oct 2002, *Ahart 9956* (CHSC).

Previous knowledge.—*Epilobium brachycarpum* (*E. paniculatum* Torr. & A. Gray; summer cotton weed) is common in dry open woodlands, grasslands, and roadsides below 3300 m elevation in the California Floristic Province (except the Channel Islands) and the Modoc Plateau north to British Columbia, and east to South Dakota, New Mexico, and eastern Canada (Hoch 1993). In the South Coast region, *E. brachycarpum* has been documented from Los Angeles, Riverside, and San Diego counties, but not from Orange County (Roberts 1998; Roberts et al. 2004; Consortium of California Herbaria 2006; Rebman & Simpson 2006).

Wetland Indicator Status.—*Epilobium brachycarpum* was not assigned a wetland indicator status on the 1988 list, but was included on the 1996 draft list with a UPL designation.

Significance and Recommended Indicator Status.—First report of *E. brachycarpum* documented from Orange County. In California, *E. brachycarpum* is found on open, usually dry disturbed ground in many plant communities (Munz & Keck 1959; Munz 1974; Hoch 1993). However, recent field work, review of local floras, and a search of local herbaria records indicates *E. brachycarpum* frequently inhabits floodplains, drying pond and lake margins, vernal alkali plains, gravel bars, banks and drying beds of ephemeral and intermittent streams, sloughs, ditches, sag ponds, seasonally flooded depressions, and perennial seeps (Yoder 1996; Banks 1999; Boyd 1999; Roberts et al. 2004; Consortium of California Herbaria 2006). Based on field observations, and information available in the literature and the Consortium of California Herbaria (2006), the status of *E. brachycarpum* should be revised and assigned a FACU wetland indicator status for California.

Eriochloa aristata Vasey (Poaceae)

CALIFORNIA. **Riverside Co.:** City of Hemet, Florida Ave. near Grant Ave., UTM (NAD 83) 0511109E 3734246N, elev. 547 m (1796 ft), locally common in wet ditch and roadside swales, 31 Jul 2004, *Riefner 04-352* (CS, RSA).

Previous knowledge.—*Eriochloa aristata* (bearded cupgrass) occupies seasonal streams and riverbanks in the San Francisco Bay region, Riverside, and Imperial counties in the Sonora Desert region of California, and in southern Arizona south through Mexico and Central America to Colombia (Munz 1974; Webster 1993a; Shaw et al. 2003). *Eriochloa aristata* has not, however, been reported from Orange, western Riverside, and San Diego counties (Roberts 1998; Roberts et al. 2004; Consortium of California Herbaria 2006; Rebman & Simpson 2006).

Wetland Indicator Status.—*Eriochloa aristata* has been assigned a FACW wetland indicator status on the 1988 list and the 1996 draft list.

Significance and Recommended Indicator Status.—First record of *E. aristata* documented from western Riverside County. Rarely collected in southern California (Webster 1993a), *E. aristata* is expected to expand its range and occupy moist roadside swale habitats in other inland valleys of western Riverside County and in eastern San Diego County. No changes to the wetland indicator status are proposed at this time.

Glinus radiatus (Ruiz Lopez & Pavon) Rohrb. (Molluginaceae)

CALIFORNIA. **Orange Co.:** City of Lake Forest, Upper Oso Reservoir, UTM (NAD 83) 11S 0441970E 3724638N, elev. 293 m (960 ft), drying margin of fluctuating lake, 24 Sep 2005, *Riefner 05-688* (RSA). **Riverside Co.:** City of Murrieta, ca. 1.5 mi E of I-15 Fwy. on Clinton Keith Rd., vicinity of Smith Ranch Rd., UTM (NAD 83) 11S 0479562E 3717088N, elev. ca. 427 m (1400 ft), uncommon in drying stock pond, 26 Sep 2003, *Riefner 03-379* (RSA, UCR).

Previous knowledge.—*Glinus radiatus* (radiate sweetjuice), native to tropical America, is known in California from the Sacramento Valley and the Peninsular Range Province (Ferren 1993). *Glinus radiatus* is local, but well documented from drainage courses, drying vernal pools and ponds, and receding shores of reservoirs and lakes in San Diego County (Beauchamp 1986; Consortium of California Herbaria 2006). It has not however, been reported from Orange or Riverside counties (Roberts 1998; Roberts et al. 2004; Consortium of California Herbaria 2006).

Wetland Indicator Status.—*Glinus radiatus* was not assigned a wetland indicator status on the 1988 list, but was included on the 1996 draft list with a NI designation.

Significance and Recommended Indicator Status.—First records of *G. radiatus* documented for Orange and Riverside counties. *Glinus radiatus* is easily confused with *G. lotoides* L., and it is likely more widespread than herbarium records indicate. *Glinus radiatus* is expected to occur at other large seasonal pond and drying lakeshore habitats in southern California. Based on field observations, and information available in the literature and the Consortium of California Herbaria (2006), the status of *G. radiatus* should be revised and assigned an OBL wetland indicator status for California. *Glinus lotoides*, which also occupies moist or seasonally dry margins of wetlands, has been assigned an OBL wetland indicator status on the 1988 and 1996 draft lists.

Limonium ramosissimum (Poir.) Maire (Plumbaginaceae)

CALIFORNIA. **Los Angeles Co.:** City of Long Beach, Belmont Shores, Colorado Lagoon in vicinity of Park Ave. and Colorado St., UTM (NAD 83) 11S 0394757E 3737423N, elev. 6 m (20 ft), uncommon in disturbed salt marsh, 21 Jan 2006, *Riefner 06-8* (RSA, UC). **Orange Co.:** City of Lake Forest, Aliso Creek near Portola Pkwy. at El Torro Rd., UTM (NAD 83) 11S 0439205E 3724613N, elev. 225 m (739 ft), drying streambed in alkaline soils, 9 Sep 2005, *Riefner 05-654* (RSA, UC); City of Newport Beach, E of Newport Bay, E of Bayside Dr. at Big Canyon Creek drainage, UTM (NAD 83) 11S 0418191E 3721588N, elev. 6 m (20 ft), common in salt marsh, 16 Sep 2005, *Riefner 05-669* (RSA); City of Irvine, Bonita Creek, along La Salud St. near Milano Dr., UTM (NAD 83) 11S 0420070E 3723153N, elev. 9 m (29 ft), common along bike trail, disturbed scrub, and on roadsides, 5 Oct 2005, *Riefner 05-707* (RSA, UC); City of Newport Beach, Newport Bay, Bay View Dr. E of Jamboree Rd., UTM (NAD 83) 11S 0419864E 3723987N, elev. 6 m (20 ft), uncommon, edge of salt marsh, 23 Nov 2005, *Riefner 05-772* (RSA, UC); City of Newport Beach, San Diego Creek near confluence with Newport Bay near SR 73 overpass, UTM (NAD 83) 11S 0419867E 3723886N, elev. 6 m (20 ft), common, edge of disturbed riparian woodland with *Saliconia*, *Euthamia occidentalis*, and *Pulicaria paludosa*, 12 Nov 2006, *Riefner 06-670* (RSA). **San Diego Co.:** San Onofre State Beach, near Echo Arch Campground, UTM (NAD 83) 11S 0449452E 3691583N, elev. 7 m (22 ft), uncommon in wet sand along edge of *Distichlis* seep, 31 Aug 2004, *Riefner 04-409* (RSA, UC); City of Carlsbad, N side of San Marcos Creek at Carlsbad Blvd., 0.2 mi S of Avenida Encinas, UTM (NAD 83) 11S 0470849E 3661229N, elev. 10 m (32 ft), uncommon on edge of mule fat-willow scrub, 7 Jan 2005, *Riefner 05-3* (RSA, UC).

Previous knowledge.—*Limonium ramosissimum* (Poir.) Maire (sea-lavender) is a European species not treated in The Jepson Manual, but recently reported from the Carpenteria salt marsh in Santa Barbara County as the subsp. *provinciale* (Pignatti) Pignatti, where it is abundantly naturalized (McClintock 1993; Hrusa et al. 2002; Smith 2005). Its identification is somewhat problematic, and due to the complexity of the genus, it is prema-

ture to assign a subspecies to this taxon without detailed comparison with European material (Smith 2005). *Limonium ramosissimum* has not been reported from Los Angeles, Orange, or San Diego counties (Roberts 1998; DiTomaso & Healy 2003; Consortium of California Herbaria 2006; Rebman & Simpson 2006). It has been cited by Roberts et al. (2004) from moist, low-lying alkaline habitats in western Riverside County, but this specimen (Lake Elsinore, *Riefner 03-241*, UCR) is referable to *Limonium* indet., which is discussed below. *Limonium ramosissimum* and *Limonium* indet. are superficially similar, often co-occur in disturbed wetland or moist ruderal habitats, are frequently used in the nursery trade, and are therefore easily confused.

Wetland Indicator Status.—*Limonium ramosissimum* has not been assigned a wetland indicator status for California or any other region on the 1988 list or the 1996 revised list.

Significance and Recommended Indicator Status.—First annotated reports of *L. ramosissimum* documented for Los Angeles, Orange, Riverside, and San Diego counties. Based on field observations and information available in the literature, *L. ramosissimum* should be added to the California regional list and assigned a FACW wetland indicator status. *Limonium ramosissimum* may be a threat to the endangered *Cordylanthus maritimus* Nutt. in salt marsh habitats at Carpenteria, Santa Barbara County (Smith 2005). *Limonium ramosissimum* is spreading rapidly, especially in salt marsh habitats, where it may also threaten sensitive species in Orange and San Diego counties. The California Invasive Plant Council should monitor it closely.

Limonium indet. (Plumbaginaceae)

CALIFORNIA. **Orange Co.:** City of Newport Beach, E of Newport Bay and E of Bayside Dr., Big Canyon Creek drainage, UTM (NAD 83) 11S 0418191E 3721588N, elev. 6 m (20 ft), common in salt marsh, 16 Sep 2005, *Riefner 05-667* (RSA, UC); City of Irvine, Bonita Creek, along La Salud St. near Milano Dr., UTM (NAD 83) 11S 0420070E 3723153N, elev. 9 m (29 ft), common along bike trail, disturbed scrub, and on roadsides, 5 Oct 2005, *Riefner 05-708* (RSA); City of Rancho Santa Margarita, along Robinson Ranch Rd. near North Peak Rd., UTM (NAD 83) 11S 0448529E 3724126N, elev. 500 m (1639 ft), common on disturbed roadside slopes, in ditches, and banks of ephemeral streambed, 4 Nov 2005, *Riefner 05-739* (RSA); City of Newport Beach, Upper Newport Bay, Bay View Dr. E of Jamboree Rd. at San Diego Creek, UTM (NAD 83) 11S 0419864E 3723987N, elev. 6 m (20 ft), uncommon, edge of salt marsh, 23 Nov 2005, *Riefner 05-774* (RSA); City of Newport Beach, E of Newport Bay, E of Back Bay Dr., flats along Big Canyon Creek, UTM (NAD 83) 11S 0418069E 3721609N, 6 m (18 ft), salt flats and scrub with *Salicornia* and *Atriplex glauca*, 11 Aug 2006, *Riefner 06-386* (RSA, UC); City of Newport Beach, Upper Newport Bay E of Jamboree Rd., UTM (NAD 83) 11S 0419547E 3723812N, elev. 6 m (20 ft), common, salt marsh with *Salicornia*, 13 Aug 2006, *Riefner 06-391* (RSA, UC); City of Newport Beach, San Diego Creek near confluence with Newport Bay near SR 73 overpass, UTM (NAD 83) 11S 0419867E 3723886N, elev. 6 m (20 ft), uncommon, edge of disturbed riparian woodland with *Salicornia*, *Euthamia occidentalis*, and *Pulicaria paludosa*, 12 Nov 2006, *Riefner 06-671* (RSA). **Riverside Co.:** Temescal Valley, W side of I-15 Freeway, ca. 1.1 mi N of Temescal Canyon Rd., UTM (NAD 83) 11S 0453861E 3739203N, 289 m (949 ft), common, planted in residential landscapes and spreading to roadsides, 2 Aug 2006, *Riefner 06-356* (RSA, UC); Corona-La Sierra area, vicinity of Green River Rd. and Palisades Dr., UTM (NAD 83) 11S 0440802E 3749217N, 141 m (462 ft), uncommon, spreading from nearby commercial/residential landscape plantings to edge of mule fat scrub, roadside ditch, and dirt lot, 22 Aug 2006, *Riefner 06-398* (RSA, UC).

Previous knowledge.—Another introduced and naturalized perennial *Limonium*, as yet unidentified to species, but probably originating from the Mediterranean region of Eurasia, has been recently collected from salt marshes in San Diego County (Smith 2005; Rebman & Simpson 2006). This unidentified taxon has not been reported from Orange or Riverside counties (Roberts 1998; Roberts et al. 2004). This species is actively being planted in tract home development projects in Orange and Riverside counties, and is spreading rapidly to native riparian and wetland habitats.

Wetland Indicator Status.—An indicator status has not been assigned to this currently unidentified species of *Limonium*.

Significance and Recommended Indicator Status.—First annotated records of the *Limonium* indet. reported for Orange and Riverside counties. This exotic perennial is more robust and aggressive than *L. ramosissimum*, and is abundantly naturalized in and around sensitive salt marsh ecological reserves. It is rapidly displacing native salt marsh species, and could also become a threat to the endangered *Cordylanthus maritimus* in the South Coast region. The California Invasive Plant Council should monitor it closely. After taxonomic problems have been resolved, it should be added to the California regional list and assigned a FACW wetland indicator status.

Oncosiphon piluliferum (L.f.) Källersjö (Asteraceae)

CALIFORNIA. **Imperial Co.:** E of El Centro, Ross Rd. ca. 0.2 mi E of Dogwood St., UTM (NAD 83) 11S 0637549E 3628051N, elev. -9 m (-28 ft), two plants on disturbed, vernally moist alkaline flats with *Atriplex* and *Suaeda*, 20 Aug 2005, *Riefner 05-644* (RSA). **Los**

Angeles Co.: Transverse Ranges, San Gabriel Mountains region, alluvial fan below San Antonio Canyon at southern base of the range, just west of Los Angeles/San Bernardino County line along north margin of the west-bound 210-Fwy. at Monte Vista/Baseline Ave. off-ramp, UTM (NAD 83) 11S 0436039E 3776202N, elev. 488 m (1600 ft), single plant along edge of road shoulder in hydroseeded scrub, 11 May 2006, *Boyd 11659* (RSA); City of Long Beach, Studebaker Rd. at 22-Fwy., UTM (NAD 83) 11S 0397935E 3737465N, elev. 6 m (20 ft), uncommon, ruderal alkaline plant community on dirt lot, 8 Jul 2006, *Riefner 06-294* (RSA); City of Long Beach, Shopkeeper Rd. at Westminster Blvd., UTM (NAD 83) 11S 0397433E 3735926N, elev. 3 m (9 ft), uncommon, edge of salt marsh and vernally moist alkaline flats, 8 Jul 2006, *Riefner 06-296* (RSA). **Riverside Co.:** Romoland, Sherman Rd. near Ethanac Rd., UTM (NAD 83) 11S 0483282E 3733376N, elev. 440 m (1443 ft), common in dry basin of seasonal pool with *Crypsis vaginiflora* and adjacent upland ruderal habitats, 30 May 2006, *Riefner 06-213* (RSA).

Previous knowledge.—*Oncosiphon piluliferum* (*Matricaria globifera* [Thunb.] Fenzl; stink-net or globe chamomile), a native to the Cape region of South Africa, was first reported in California from Orange and San Diego counties (Sanders 1996). It is now locally common and spreading rapidly across western Riverside County (Hrusa et al. 2002; Roberts et al. 2004; Riefner & Boyd 2005a). It has also been reported from Arizona, where it has been documented from roadside, desert scrub, and wash and floodplain riparian habitats (Landrum et al. 2005).

Wetland Indicator Status.—*Oncosiphon piluliferum* has not been assigned a wetland indicator status for California on the 1988 list or the 1996 draft list in any region of the United States.

Significance and Recommended Indicator Status.—First records of *O. piluliferum* documented for Imperial and Los Angeles counties. In western Riverside County, this species is well documented from alkali playa and vernal alkali plain habitats dominated by facultative wetland species including *Plagiobothrys leptocladus*, *Cressa truxillensis*, *Crypsis schoenoides*, *Rumex crispus*, and *Atriplex argentea* (Hrusa et al. 2002). It is spreading to low-lying vernal alkaline habitats in Imperial and Los Angeles counties. However, *O. piluliferum* is invading a variety of disturbed upland and seasonal wetlands habitats, including roadside, field, floodplain, seasonal pool, and scrub habitats in southern California and Arizona (Roberts et al. 2004; Riefner & Boyd 2005a; Landrum et al. 2005). *Oncosiphon piluliferum* is expected to become a widespread invasive species in Arizona, which serves as an example of the potential impacts to native vegetation when a non-native ornamental species becomes naturalized (Landrum et al. 2005). It is also spreading explosively in southern California, and the California Invasive Plant Council should monitor *O. piluliferum* closely. Based on field observations, information available in the literature, and review of the Consortium of California Herbaria (2006), *O. piluliferum* should be added to the California regional list. We propose a FACU* wetland indicator status and recommend additional regional review to specifically define its frequency of occurrence in wetlands as the species undergoes further expansions of range and invasion of new habitat types in California.

Panicum coloratum L. (Poaceae)

CALIFORNIA. **Imperial Co.:** S of El Centro, Bowker Rd. near McCabe Rd., UTM (NAD 83) 11S 0643807E 3624673N, elev. 2 m (6 ft), uncommon in wet irrigation ditch, 9 Oct 2006, *Riefner 06-497* (RSA); S of El Centro, Heber Rd. near Hwy. 86, UTM (NAD 83) 11S 0635522E 3622345N, elev. 2 m (6 ft), uncommon in ditch with *Typha* and *Chloracantha spinosa*, 9 Oct 2006, *Riefner 06-500* (RSA); E of El Centro, along Ross Rd. near Bass Cove Rd., N of Hwy 8., UTM (NAD 83) 11S 0638008E 3628013N, elev. -9 m (-30 ft), common and widespread in ditches, along irrigation canals, and in low-lying wet fields, 9 Oct 2006, *Riefner 06-512* (RSA, UWSP). **Los Angeles Co.:** City of Altadena, along Calveras St. near Hollister Ave., UTM (NAD 83) 11S 0396508E 3783148N, 390 m (1280 ft), uncommon, street gutter in moist soil with *Eleusine*, 22 Aug 2004, *Riefner 04-378* (RSA). **Orange Co.:** City of Los Alamitos, Oak Middle School, vicinity of Oak St. at Catalina St., UTM (NAD 83) 11S 0400172E 3741242N, 14 m (45 ft), very rare, moist depressions in ball field turf grass with *Eleusine*, 3 Sep 2004, *Riefner 04-425* (RSA).

Previous knowledge.—*Panicum coloratum* (kleingrass) is an African species occasionally cultivated for forage that has been introduced into subtropical and tropical regions worldwide (Freckmann & Lelong 2003). In the United States, it is currently known only from New Mexico and Texas, where it grows in open, usually wet ground (Freckmann & Lelong 2003).

Wetland Indicator Status.—*Panicum coloratum* has not been assigned a wetland indicator status for California on the 1988 list or the 1996 draft list.

Significance and Recommended Indicator Status.—First record of *P. coloratum* documented for California, which likely represents a recent introduction. As with many other African grasses now established in southern California, this weedy species could spread rapidly to other disturbed, moist-soil habitats in the south

coast region. Based on initial field observations and information available in the literature, *P. coloratum* should be added to the California regional list. We propose a FACW* wetland indicator status. Additional regional review is needed to refine its frequency of occurrence in wetlands, as the species will likely undergo further expansions of range and colonization of different habitat types in southern California.

Panicum dichotomiflorum Michx. subsp. **dichotomiflorum** (Poaceae)

CALIFORNIA. **Orange Co.:** City of Huntington Beach, Huntington Central Park at Goldenwest St., UTM (NAD 83) 11S 0406884E 3729853N, elev. 1 m (3 ft), common in and along the edge of shallow water ponds, 20 Sep 2005, *Riefner 05-674* (RSA, UWSP); City of Yorba Linda, Santa Ana River near Yorba Linda Regional Park, UTM (NAD 83) 11S 0430104E 3748155N, elev. 98 m (320 ft), common on sandbars and riverbanks with perennial waters, 27 Oct 2005, *Riefner 05-735* (RSA, UWSP). **Riverside Co.:** City of Corona, E of Santa Ana Canyon along Santa Ana River, ca. 0.5 mi S of 71 Freeway, UTM (NAD 83) 11S 0439689E 3749438N, elev. 135 m (442 ft), uncommon in wet river wash sand, 18 Sep 2004, *Riefner 04-435* (RSA).

Previous knowledge.—*Panicum dichotomiflorum* subsp. *dichotomiflorum* (fall panic grass), native to the eastern United States, is found in the San Joaquin Valley and the South Coast region of California (Webster 1993b). It grows in open, often wet disturbed areas in a wide variety of habitats, including cultivated and fallow fields, roadsides, ditches, stream banks, along receding shores of lakes, clearings in floodplains, and in shallow water (Freckmann & Lelong 2003). In southern California, *P. dichotomiflorum* has been collected from San Bernardino, San Diego, and Santa Barbara counties, but not from Orange or Riverside counties (Munz 1974; Roberts 1998; Roberts et al. 2004; Consortium of California Herbaria 2006, Rebman & Simpson 2006). This weedy species was not included in the treatment of aquatic and riparian weeds by DiTomaso & Healy (2003).

Wetland Indicator Status.—*Panicum dichotomiflorum* subsp. *dichotomiflorum* has been assigned a FACW wetland indicator status for California on the 1988 list and the 1996 draft list.

Significance and Recommended Indicator Status.—First records of *P. dichotomiflorum* subsp. *dichotomiflorum* documented for Orange and Riverside counties. This grass will likely become a common weed of disturbed wetland and riparian habitats throughout coastal southern California.

The *P. dichotomiflorum* complex shows great plasticity of growth forms in response to environmental conditions, which is the case of the extremely robust plants collected from the Santa Ana River in Orange and Riverside counties. These specimens have spikelets similar to *P. dichotomiflorum* subsp. *puritanorum* (Svenson) Freckmann & Lelong, but no other characters. Given the great variation in the *P. dichotomiflorum* complex and especially the effect of growing conditions on robustness, the Santa Ana River specimens are best treated as the subsp. *dichotomiflorum* (pers. com., R.W. Freckmann, October 2006). No changes to the wetland indicator status are proposed at this time.

Panicum virgatum L. (Poaceae)

CALIFORNIA. **Orange Co.:** near City of Anaheim, Santa Ana Canyon, N side of Santa Ana River channel, Santa Ana Canyon, W (downstream) ca. 1.25 mi from Green River Golf Course, UTM (NAD 83) 11S 0434148E 3748318N, elev. 120 m (387 ft), uncommon in moist swales, on river sandbars, and in *Baccharis salicifolia* scrub, 19 Sep 2006, *Riefner 06-439* (RSA, UWSP); City of Irvine, San Diego Creek near 405-Freeway, UTM (NAD 83) 11S 0429336E 3724184N, elev. 49 m (162 ft), uncommon on moist sandy banks and margin of riparian woodland, 8 Oct 2006, *Riefner 06-482* (RSA).

Previous knowledge.—*Panicum virgatum* (including *P. havardii* Vasey; switchgrass, panic raide) has not been reported previously for California (Webster 1993b; Freckmann & Lelong 2003). It grows in mesic to wet tallgrass prairies, and on dry slopes, sand, open oak or pine woodlands, shores, riverbanks, and brackish marshes. *Panicum virgatum* occurs primarily on the eastern side of the Rocky Mountains, extending from southern Canada to Mexico, Cuba, Bermuda, and Costa Rica, but is also found in Nevada, Utah, and Arizona (Freckmann & Lelong 2003). *Panicum virgatum* is planted for range and wildlife habitat improvement, and has been introduced as a forage grass to other parts of the world (Freckmann & Lelong 2003).

Wetland Indicator Status.—Not previously known from California, *P. virgatum* was not assigned a wetland indicator status on the 1988 California list, but it was included on the 1996 draft list with a FAC wetland indicator status for most other regions.

Significance and Recommended Indicator Status.—First records of *P. virgatum* documented for California, which likely represents an escape from cultivation or habitat enhancement plantings. Based on initial field observations and information available in the literature, *P. virgatum* should be added to the California regional list. We

propose a FAC* wetland indicator status and recommend additional regional review to refine its frequency of occurrence in wetlands, as the species will likely undergo further expansions of range and colonization of different habitat types in southern California.

Paspalum urvillei Steudel (Poaceae)

CALIFORNIA. **Orange Co.:** City of Lake Forest, Alton Pkwy. at Bertea Rd., UTM (NAD 83) 11S 0434065E 3724402N, elev. 123 m (402 ft), common, growing with *Baccharis salicifolia* and *Picris* in ditches, swales, and fields, 4 Nov 2005, *Riefner 05-742* (RSA, UCR).

Previous knowledge.—*Paspalum urvillei* (vaseygrass), a native of South America, occupies disturbed, moist to wet places in the Sacramento Valley and the South Coast region (Webster 1993c; DiTomaso & Healy 2003). However, Allen & Hall (2003) did not report it from southern California. Local herbaria have specimens from San Bernardino and San Diego counties, where it occupies streambeds, margins of lakes and meadows, and roadside habitats, but it has not been collected from Riverside and Orange counties (Roberts 1998; Roberts et al. 2004; Consortium of California Herbaria 2006; Rebman & Simpson 2006). *Paspalum urvillei* is more common in the southern United States, but is expected to expand its range in California (DiTomaso & Healy 2003).

Wetland Indicator Status.—*Paspalum urvillei* has been assigned a NI* designation for California on the 1988 list and the 1996 draft list.

Significance and Recommended Indicator Status.—First record of *P. urvillei* documented for Orange County, and additional populations will likely be discovered in the South Coast region. Field observations, a literature review, and a review of herbarium data indicate this species frequently inhabits moist soil habitats in California (DiTomaso & Healy 2003; Consortium of California Herbaria 2006). A revised FACU wetland indicator status is proposed for the California regional list.

Psilocarphus chilensis A. Gray (Asteraceae)

CALIFORNIA. **Riverside Co.:** Winchester, Patton Rd. at Patterson Ave., UTM (NAD 83) 11S 0492961E 3728074N, elev. 452 m (1483 ft), common in shallow roadside depressions with *Plagiobothrys leptocladus*, 22 Apr 2005, *Riefner 05-239* (RSA, UCR); City of Lake Elsinore, back basin of Lake Elsinore, W ca. 0.5 mi off Pete Lehr Drive at Diamond Stadium in Wildlife Viewing Area, UTM (NAD 83) 11S 0471224E 3723561N, elev. 402 m (1320 ft), uncommon in shallow depressions with *Plagiobothrys acanthocarpus* and *Plantago elongata* in saltgrass meadows, 8 Apr 2006, *Riefner 06-306* (RSA, UCR); Romoland, Sherman Rd. near Ethanac Rd., UTM (NAD 83) 11S 0483293E 3733281N, elev. 440 m (1443 ft), uncommon in dry basin of detention pond with *Crypsis vaginiflora*, 30 May 2006, *Riefner 06-215* (RSA).

Previous knowledge.—*Psilocarphus chilensis* (*P. tenellus* Nutt. var. *globiferus* [DC.] Morefield; round woolly marbles) is an amphitropical disjunct, known in North America only from California, and from Chile in South America (Morefield 2006). *Psilocarphus chilensis* occupies saturated to drying vernal pools, seasonally inundated sites, and coastal interdune areas of the Sierra Nevada foothills to the Central Coast region and south to the San Joaquin Valley (Morefield 1993). In southern California, *P. chilensis* is known only from the Winchester and Domenigoni Valley region of western Riverside County (Boyd & Ross 1996; Roberts et al. 2004; Morefield 2006).

Wetland Indicator Status.—*Psilocarphus chilensis* (*P. tenellus* var. *globiferus*) has not been assigned a wetland indicator status for California on the 1988 list or the 1996 draft list.

Significance and Recommended Indicator Status.—First report of *P. chilensis* documented for the Romoland and Elsinore Valley regions of western Riverside County. This species is tolerant of disturbed conditions, occurs in man-made or modified seasonal pool habitats, and is expected to occur elsewhere in cismontane southern California, especially interior valleys in Riverside and San Diego counties. Based on field observations, information available in the literature, and review of the Consortium of California Herbaria (2006), *P. chilensis* should be added to the California regional list and assigned an OBL wetland indicator status.

Salvinia molesta D.S. Mitch. (Salviniaceae)

CALIFORNIA. **Orange Co.:** City of Huntington Beach, Huntington Central Park at Goldenwest St., UTM (NAD 83) 11S 0407062E 3730088N, elev. 1 m (3 ft), very rare in still-water pond with *Lemna* and *Eichhornia crassipes* in willow riparian woodland, 30 Sep 2005, *Riefner 05-700* (RSA); City of Irvine, along Jeffrey Rd. N of Barranca Rd., UTM (NAD 83) 11S 0427803E 3726479N, elev. 47 m (155 ft), uncommon, growing with *Eichhornia crassipes* in irrigation pond in agricultural field, 5 May 2005, *Riefner 05-304* (RSA).

Previous knowledge.—*Salvinia molesta* (giant salvinia) is an invasive, free-floating aquatic fern native to South America that has proven to be a troublesome weed in many warm freshwaters of the world (Barrett

1989). In the United States, this federally listed noxious weed occurs across the southern states from Florida to California (Barrett 1989; DiTomaso & Healy 2003). In California, *S. molesta* is well known from the lower Colorado River drainage in Imperial and Riverside counties, but small populations have also been reported along the coast in Orange, San Diego, and San Luis Obispo counties (Hrusa et al. 2002; Riefner & Boyd 2005b).

Salvinia molesta appears to only reproduce vegetatively in the United States, but is capable of rapid growth in warm, slow-moving waters where it can be devastating to aquatic native species by covering large areas (Mitchell et al. 1980; DiTomaso & Healy 2003). In most cases, the range of this plant is temperature limited. *Salvinia molesta* survives extremes of 3°C and 43°C, however optimal growth occurs at 24°C to 28°C (Whiteman & Room 1991). *Salvinia molesta* has been recognized as a species with the potential to spread explosively in California (CalEPPC 1999).

Wetland Indicator Status.—*Salvinia molesta* has not been assigned a wetland indicator status for California on the 1988 list or the 1996 draft list. *Salvinia auriculata* Aubl. is included on the 1996 draft list with an OBL wetland indicator status for the Caribbean and North Central regions, and a NI indicator status for the Northeast, Southeast, and South Plains regions, but not for California. *Salvinia auriculata* has been misapplied to *Salvinia* species in the United States, including *S. minima* Baker (*S. auriculata* auct. non Aubl.), which occurs in New Mexico and other southern states (Nauman 1993; DiTomaso & Healy 2003).

Significance and Recommended Indicator Status.—New locations of *S. molesta* documented for Orange County. This species is spreading, most likely by waterfowl, in the mild Mediterranean climate of southern California. *Salvinia molesta* may be expected to naturalize in the same areas where water hyacinth (*Eichhornia crassipes* [Mort.] Solms) is known to grow, including slow-moving freshwaters in regions that may experience frost but not the formation of ice (Whiteman & Room 1991; DiTomaso & Healy 2003; Riefner & Boyd 2005b). Based on field observations and information available in the literature, *S. molesta* should be added to the California regional list and assigned an OBL wetland indicator status.

Setaria adhaerens (Forssk.) Chiov. (Poaceae)

CALIFORNIA. **Los Angeles Co.:** City of Pasadena, Arroyo Seco Creek, S of Arroyo Blvd., UTM (NAD 83) 11S 0392637E 3779048N, 226 m (740 ft), uncommon along creek in wet sand and on sand bars with *Eleusine*, *Ehrharta erecta*, *Leptochloa fusca* subsp. *uninervia*, and *Xanthium strumarium*, 22 Aug 2004, *Riefner 04-383* (RSA). **Orange Co.:** City of Anaheim, Santa Ana River bottom, E of 57-Freeway between Orangewood St. and Chapman Ave., UTM (NAD 83) 11S 0418311E 3739098N, 41 m (135 ft), locally abundant, disturbed wetlands, margins of active channels, and on sandbars with *Echinochloa crus-galli*, *Leptochloa fusca* subsp. *uninervia*, and *Xanthium strumarium*, 8 Aug 2004, *Riefner 04-373a* (RSA); City of Irvine, San Diego Creek at Woodbridge High School, S of intersection of Barranca Rd. and West Yale Loop Rd., UTM (NAD 83) 11S 0425279E 3727007N, elev. 27 m (89 ft), uncommon, growing with *Cynodon dactylon* and *Xanthium strumarium* on disturbed creek terrace, 27 Aug 2004, *Riefner 04-389* (RSA); City of Irvine, San Diego Creek near 405-Freeway, UTM (NAD 83) 11S 0429336E 3724184N, elev. 51 m (166 ft), uncommon on moist sandy banks and wet sand along creek channel with *Echinochloa crus-galli*, *Leptochloa fusca* subsp. *uninervia*, and *Ludwigia repens*, 8 Oct 2006, *Riefner 06-480* (RSA); City of Santa Ana, 17th St. at 55-Fwy., UTM (NAD 83) 11S 0422908E 3735773N, elev. 49 m (160 ft), common along roadside in ruderal vegetation, 23 Jul 2006, *Riefner 06-310* (RSA); City of Huntington Beach, Atlanta St. at Surge Ln., UTM (NAD 83) 11S 0411693E 3724638N, elev. 11 m (35 ft), sidewalk weed, 6 Aug 2006, *Riefner 06-373* (RSA). **Riverside Co.:** City of Riverside, residential lots and roadside along Elderwood Ct. at Tequesquite Ave., UTM (NAD 83) 11S 0463408E 3759616N, elev. 237 m (777 ft), common in irrigated landscape and roadside seepage areas, 7 Oct 2005, *Riefner 05-723* (ASC, RSA); City of La Sierra; Gramercy Pl. near La Sierra Ave., UTM (NAD 83) 11S 0454476E 3754271N, elev. 227 m (746 ft), sidewalk and gutter weed, 30 Dec 2005, *Riefner 05-793* (RSA). **San Bernardino Co.:** City of Fontana, Merrill St. at Olive St., UTM (NAD 83) 11S 0459593E 3772444N, elev. 381 m (1250 ft), uncommon in drainage ditch with *Cyperus* in vacant dirt lot, 5 Oct 2005, *Riefner 05-722* (RSA). **San Diego Co.:** Kearny Mesa, Clairemont Mesa Rd. near Ruffner Rd., UTM (NAD 83) 11S 0485359E 3632725N, elev. 122 m (401 ft), irrigated landscape with *Agrostis*, 19 Nov 2006, *Riefner 06-679* (RSA).

Previous knowledge.—*Setaria adhaerens* (burr bristlegrass) grows in subtropical and tropical regions throughout the world (Rominger 2003). In North America, it occurs in the southern United States, northeastern Mexico, Cuba, and the Bahamas (Rominger 2003). In California, it is known only from the Kern County region, which may represent a recent introduction (Rominger 2003). *Setaria adhaerens* has not been collected from Los Angeles, Orange, Riverside, San Bernardino, or San Diego counties (Webster 1993d; Roberts 1998; Rominger 2003; Roberts et al. 2004; Consortium of California Herbaria 2006; Rebman & Simpson 2006).

Wetland Indicator Status.—*Setaria adhaerans* was not assigned a wetland indicator status on the 1988 list or

the 1996 draft list for any region in the United States. *Setaria verticillata* (L.) P. Beauv., native to Europe, resembles *S. adhaerens* and also occupies disturbed moist-soil habitats in southern California. *Setaria verticillata* has been assigned a NI* wetland indicator status for California on the 1988 list and a FACU wetland indicator status on the 1996 draft list.

Significance and Recommended Indicator Status.—First documented report of *S. adhaerens* for Los Angeles, Orange, Riverside, San Bernardino, and San Diego counties. Based on initial field observations and information available in the literature, *S. adhaerens* should be added to the California regional list. We propose a FACU* wetland indicator status. This species will likely undergo further expansions of range and colonization of different habitat types in southern California, which will require further review to refine its frequency of occurrence in wetlands.

Setaria megaphylla (Steud.) T. Durand & Schinz (Poaceae)

CALIFORNIA. **Orange Co.:** City of Huntington Beach, Huntington Central Park near Goldenwest St., UTM (NAD 83) 11S 0406845E 3730055N, elev. 1 m (3 ft), uncommon in disturbed *Salix*-dominated riparian woodland with *Echinochloa crus-galli* and *Paspalum dilatatum*, 27 Oct 2005, *Riefner 05-731* (RSA); City of Newport Beach, urban creek draining into San Diego Creek near confluence with Newport Bay at SR 73 overpass, UTM (NAD 83) 11S 0419895E 3723901N, elev. 6 m (19 ft), locally common in moist disturbed riparian woodland with *Euthamia occidentalis* and *Pulicaria paludosa*, 12 Nov 2006, *Riefner 06-667* (ASC, RSA); City of San Juan Capistrano, San Juan Creek at La Novia Ave., UTM (NAD 83) 11S 0439744E 3707154N, elev. 22 m (72 ft), uncommon and widely scattered in riparian scrub, 19 Nov 2006; *Riefner 06-683* (RSA).

Previous knowledge.—*Setaria megaphylla* (bigleaf bristlegrass), native to tropical Africa and tropical America, has not been reported previously for California (Webster 1993d; Rominger 2003). In North America, it is apparently established only in Florida, although it is occasionally cultivated for its ornamental, plicate leaves (Rominger 2003).

Wetland Indicator Status.—*Setaria megaphylla* was not assigned a wetland indicator status on the 1988 list or the 1996 draft list for any region in the United States. *Setaria palmifolia* (J. König) Stapf, a species similar to *S. megaphylla*, has been assigned a NI wetland indicator status for the Southeast region and a FACU wetland indicator status for Hawaii.

Significance and Recommended Indicator Status.—First report of *S. megaphylla* documented for California, which likely represents an escape from cultivation. Based on initial field observations and information available in the literature, *S. megaphylla* should be added to the California regional list. We propose a NI wetland indicator status. This species may undergo further expansions of range and colonization of different habitat types in southern California, but may be restricted to moist soils and mild climate along the immediate coast. Additional monitoring of new populations is necessary to determine its frequency of occurrence in wetlands.

DISCUSSION

Wetlands, streams and their associated riparian vegetation communities are important natural resources in urban and suburban southern California (White & Greer 2006). The increased area of impervious surfaces and imported municipal water supplies associated with the urbanization of coastal watersheds have driven significant and often undocumented changes in many of coastal southern California's wetland and riparian vegetation communities by altering stream flow characteristics, channel geomorphology, and historic plant community composition (Greer & Stow 2003; Burkhart 2006). In southern California, and many other urban watersheds, these changes also include dramatic shifts from historic episodic stream flows following major storm events to perennial base flows, which is often accompanied by an expansion of wetland and riparian vegetation, including human-adaptive or disturbance-tolerant native species, and an overall decline in native species richness (Magee et al. 1999; Dwire et al. 2000; Shanahan & Crear 2004; Burkhart & Kelly 2005; Burkhart 2006; White & Greer 2006). Also, the direct effects of the introduction of exotic species in suburban and urban environments have significantly modified the character of the native vegetation and integrity of wetland and riparian ecosystems associated with many urban environments, which is directly related to available moisture, and secondarily to disturbance (Suarez et al. 1998; Magee et al. 1999; McKinney 2002; Radeloff et al. 2005). The effects of urban development on ecological communities have only recently become a topic

TABLE 2. Summary of distributional records for southern California, and proposed revisions and additions to the National List of Plant Species that Occur in Wetlands.

Species (*=exotic taxon)	Significance in California and Recommended Wetland Indicator Status
*****_Amaranthus blitum_ subsp. _emarginatus_	New to Orange County; spreading to urban wetlands and stream course habitats; propose FAC* wetland indicator status.
Atriplex polycarpa	New to western Riverside County; alkaline soil habitats in southern California are in need of focused study; concur with current FACU indicator status.
*****_Bacopa monnierii_	New to Orange County; one of many subtropical and tropical weeds invading coastal southern California; concur with revised OBL indicator status.
*****_Beta vulgaris_ subsp. _maritima_	New to Riverside County; propose FAC* wetland indicator status.
*****_Chloris truncata_	New to San Bernardino County; propose NI* wetland indicator status.
*****_Ehrharta erecta_	New to Imperial County and verification of an unreported Orange County herbarium record; spreading rapidly from urban to native habitats; new records documented from native riparian and stream course habitats in Los Angeles, Orange, and Ventura counties; assign FAC wetland indicator status.
*****_Elytrigia repens_	New to Orange County; concur with revised FAC* indicator status.
Epilobium brachycarpum	New to Orange County; revise from UPL and assign FACU wetland indicator status.
Eriochloa aristata	New to western Riverside County; expected elsewhere in disturbed wetland habitats in southern California; concur with current FACW indicator status.
*****_Glinus radiatus_	New to Orange and western Riverside counties; likely more widespread than current records indicate; revise from NI and assign OBL wetland indicator status.
*****_Limonium ramosissimum_	New to Los Angeles, Orange, Riverside, and San Diego counties; spreading rapidly; threat to the endangered _Cordylanthus maritimus_ in salt marsh habitats; assign FACW wetland indicator status.
*****_Limonium_ indet.	New to Orange and Riverside counties; spreading rapidly from cultivation; potential threat to the endangered _Cordylanthus maritimus_ in salt marsh habitats; assign FACW wetland indicator status following identification to species.
*****_Oncosiphon piluliferum_	New to Imperial and Los Angeles counties; potential to spread explosively; propose FACU* wetland indicator status.
*****_Panicum coloratum_	New to California; African species with potential to spread explosively; propose FACW* wetland indicator status.
*****_Panicum dichotomiflorum_ subsp. _dichotomiflorum_	New to Orange and Riverside counties; expected to invade disturbed wetland and riparian habitats throughout the South Coast region; concur with current FACW indicator status.
*****_Panicum virgatum_	New to California; propose FAC* wetland indicator status.
*****_Paspalum urvillei_	New to Orange County; revise from NI* and propose FACU wetland indicator status.
Psilocarphus chilensis	New to Romoland and Elsinore Valley regions of western Riverside County; assign OBL wetland indicator status.
*****_Salvinia molesta_	New populations reported for Orange County; federally listed noxious weed with potential to spread explosively; assign OBL wetland indicator status.
*****_Setaria adhaerens_	New to Los Angeles, Orange, Riverside, San Bernardino, and San Diego counties; subtropical and tropical weed spreading rapidly in coastal southern California; propose FACU* wetland indicator status.
*****_Setaria megaphylla_	New to California; recent introduction of another tropical species; propose NI wetland indicator status.

of study, however, and few comprehensive surveys have been carried out in coastal southern California, or in other regions, to document this relatively recent phenomenon (Dwire et al. 2000; Hansen et al. 2005; Burkhart 2006; White & Greer 2006). Botanists and ecologists have traditionally focused their research on wildland ecosystems, but the new records presented herein, and summarized in Table 2, suggest that detailed floristic studies are needed to thoroughly document the flora of wetland and riparian communities in urban ecosystems and in surrounding native habitats degraded by exotic species throughout the South Coast region.

Expected declines in native plant biodiversity of wetland and riparian ecosystems in or near wildland

habitats, and in urban nature preserves and parks, pose major environmental problems to resource conservation planning, especially in California, which has the highest number of wildland-urban interface (WUI) housing units in the United States (McKinney 2002; Pysek et al. 2002; Hansen et al. 2005; Radeloff et al. 2005). As long as the amiable climate and the strong economy of coastal southern California continues to attract urbanization and other forms of high density human activity, and without coordinated land-use planning and ecologically-based conservation efforts, it will not be likely that substantial gains in area, native floristic diversity, and unique wetland- and riparian-related functions and values will occur (Brinson & Malvárez 2002; Broberg 2003).

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